

04/05/2019



Antero Resources
1615 Wynkoop Street
Denver, CO 80202
Office 303.357.7310
Fax 303.357.7315

April 12, 2019

West Virginia Department of Environmental Protection
Office of Oil and Gas
601 57th Street
Charleston, WV 25304

To Whom It May Concern:

Please find enclosed the Well Operator's Report of Well Work, Form WR-35 (including As-Drilled Survey Plat, Directional Survey and FracFocus report), Discharge Monitoring Report Form WR-34 and corresponding logs for the following wells:

- San Juan Unit 2H (API # 47-095-02381)—Vera Pad
- San Juan Unit 3H (API # 47-095-02382)—Vera Pad
- San Juan Unit 4H (API # 47-095-02383)—Vera Pad
- Ant Unit 1H (API # 47-095-02400)—Vera Pad
- Ant Unit 2H (API # 47-095-02401)—Vera Pad
- Ant Unit 3H (API # 47-095-02402)—Vera Pad
- Emerger Unit 1H (API # 47-095-02412)—Vera Pad

If you have any questions please feel free to contact me at (303) 357-7223.

Sincerely,

A handwritten signature in black ink, appearing to read "Megan Griffith", with a long horizontal stroke extending to the right.

Megan Griffith
Permitting Agent
Antero Resources Corporation

Enclosures

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

API 47 - 095 - 02400 County Tyler District Centerville
Quad Middlebourne 7.5' Pad Name Vera Pad Field/Pool Name ----
Farm name Vera O. Thomas Well Number Ant Unit 1H
Operator (as registered with the OOG) Antero Resources Corporation
Address 1615 Wynkoop Street City Denver State CO Zip 80202

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4363995m Easting 508270m
Landing Point of Curve Northing 4363766.39m Easting 507899.59m
Bottom Hole Northing 4361378m Easting 508782m

Elevation (ft) 1148.1' GL Type of Well New Existing Type of Report Interim Final
Permit Type Deviated Horizontal Horizontal 6A Vertical Depth Type Deep Shallow
Type of Operation Convert Deepen Drill Plug Back Redrilling Rework Stimulate
Well Type Brine Disposal CBM Gas Oil Secondary Recovery Solution Mining Storage Other _____
Type of Completion Single Multiple Fluids Produced Brine Gas NGL Oil Other _____
Drilled with Cable Rotary

Drilling Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
Production hole Air Mud Fresh Water Brine
Mud Type(s) and Additive(s)
Air - Foam & 4% KCL
Mud - Polymer

Date permit issued 1/24/2017 Date drilling commenced 3/22/2017 Date drilling ceased 9/24/2017
Date completion activities began 1/23/2018 Date completion activities ceased 6/26/2018
Verbal plugging (Y/N) N/A Date permission granted N/A Granted by N/A

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 65', 215', 261', 399' Open mine(s) (Y/N) depths No
Salt water depth(s) ft 620', 1614', 1974' Void(s) encountered (Y/N) depths No
Coal depth(s) ft 620', 879' Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) No

Reviewed by:

WR-35
Rev. 8/23/13

API 47-095 - 02400 Farm name Vera O. Thomas Well number Ant Unit 1H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	24"	20"	95'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	743'	New	48#, H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2611'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	15869'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6885'		4.7#, N-80		
Packer type and depth set		N/A					

Comment Details _____

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	Class A	n/a sx	15.6	1.18	120	0'	8 Hrs.
Surface	Class A	650 sx	15.6	1.18	826	0'	8 Hrs.
Coal							
Intermediate 1	Class A	960 sx	15.6	1.18	1181	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	733 sx (Lead) 1372 sx (Tail)	13.5 (Lead), 15.2 (Tail)	1.53 (Lead), 1.83 (Tail)		-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 15869' MD, 6571' TVD (BHL), 6586' (Deepest Point Drilled) Loggers TD (ft) 15869' MD

Deepest formation penetrated Marcellus Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 6049'

Check all wireline logs run caliper density deviated/directional induction
 neutron resistivity gamma ray temperature sonic

Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING _____

Conductor - 0

Surface - 1 above guide shoe, 1 above insert float, 1 every 4th joint to surface

Intermediate - 1 above float joint, 1 above float collar, 1 every 4th joint to surface

Production - 1 above float joint, 1 below float collar, 1 every 3rd joint to top of cement

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED N/A

WR-35
Rev. 8/23/13

API 47- 095 - 02400 Farm name Vera O. Thomas Well number Ant Unit 1H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
Marcellus	6571' (TOP) TVD	6935' (TOP) MD

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 2800 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW Gas 5457 mcfpd Oil 110 bpd NGL --- bpd Water 34 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
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***PLEASE SEE ATTACHED EXHIBIT 3**

Please insert additional pages as applicable.

Drilling Contractor Frontier Drilling LLC
Address 562 Spring Run Road City Pennsboror State WV Zip 26415

Logging Company Schlumberger
Address 5599 San Felipe Street City Houston State TX Zip 77056

Cementing Company C&J Energy Services
Address 1650 Hackers Creek City Jane Lew State WV Zip 26378

Stimulating Company Baker Hughes
Address 837 Philippi Pike City Clarksburg State WV Zip 26301

Please insert additional pages as applicable.

Completed by Megan Griffith Telephone 303-357-7223
Signature  Title Permitting Agent Date 4/12/2019

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

API 47-095-02400 Farm Name Vera O. Thomas Well Number Ant Unit 1H					
EXHIBIT 1					
Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	3/1/2018	15600	15766	60	Marcellus
2	3/2/2018	15404	15570	60	Marcellus
3	3/2/2018	15207	15373	60	Marcellus
4	3/3/2018	15011	15177	60	Marcellus
5	3/3/2018	14814	14980	60	Marcellus
6	3/4/2018	14618	14784	60	Marcellus
7	3/5/2018	14421	14587	60	Marcellus
8	3/5/2018	14225	14391	60	Marcellus
9	3/6/2018	14029	14194	60	Marcellus
10	3/6/2018	13832	13998	60	Marcellus
11	3/7/2018	13636	13801	60	Marcellus
12	3/7/2018	13439	13605	60	Marcellus
13	3/8/2018	13243	13408	60	Marcellus
14	3/8/2018	13046	13212	60	Marcellus
15	3/9/2018	12850	13015	60	Marcellus
16	3/10/2018	12653	12819	60	Marcellus
17	3/10/2018	12457	12622	60	Marcellus
18	3/11/2018	12260	12426	60	Marcellus
19	3/11/2018	12064	12229	60	Marcellus
20	3/12/2018	11867	12033	60	Marcellus
21	3/12/2018	11671	11836	60	Marcellus
22	3/13/2018	11474	11640	60	Marcellus
23	3/14/2018	11278	11443	60	Marcellus
24	3/14/2018	11081	11247	60	Marcellus
25	3/15/2018	10885	11050	60	Marcellus
26	3/15/2018	10688	10854	60	Marcellus
27	3/15/2018	10492	10657	60	Marcellus
28	3/16/2018	10295	10461	60	Marcellus
29	3/17/2018	10099	10264	60	Marcellus
30	3/17/2018	9902	10068	60	Marcellus
31	3/18/2018	9706	9871	60	Marcellus
32	3/18/2018	9509	9675	60	Marcellus
33	3/19/2018	9313	9478	60	Marcellus
34	3/20/2018	9116	9282	60	Marcellus
35	3/21/2018	8920	9085	60	Marcellus
36	3/21/2018	8723	8889	60	Marcellus
37	3/22/2018	8527	8692	60	Marcellus
38	3/23/2018	8330	8496	60	Marcellus
39	3/23/2018	8134	8299	60	Marcellus
40	3/24/2018	7937	8103	60	Marcellus
41	3/24/2018	7741	7906	60	Marcellus
42	3/25/2018	7544	7710	60	Marcellus
43	3/25/2018	7348	7513	60	Marcellus
44	3/25/2018	7151	7317	60	Marcellus
45	3/26/2018	6955	7120	60	Marcellus

API 47-095-02400 Farm Name Vera O. Thomas Well Number Ant Unit 1H

EXHIBIT 2

Stage No.	Stimulations Date	Avg Pump Rate	Avg Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/ other (units)
1	3/1/2018	77.2	7428	5223	3964	16615	10580.38	N/A
2	3/2/2018	70.4	7767	4993	4588	17348	10546.79	N/A
3	3/2/2018	76	7597	6216	3820	17633	10410.43	N/A
4	3/3/2018	77.8	7693	5064	3718	16475	9957.667	N/A
5	3/3/2018	76	7484	5514	3045	16043	10236.88	N/A
6	3/4/2018	75.3	7340	5796	3769	16905	10372.93	N/A
7	3/5/2018	74.2	7446	5341	3664	16451	10113.1	N/A
8	3/5/2018	78	7597	5888	3707	17192	10064.88	N/A
9	3/6/2018	75.8	7612	6131	3608	17351	10176.52	N/A
10	3/6/2018	74	7045	4125	3598	14768	9889.095	N/A
11	3/7/2018	59.9	6784	5784	3786	16354	10085.95	N/A
12	3/7/2018	76.9	7607	5638	3649	16894	10079.88	N/A
13	3/8/2018	76.1	7284	4858	3858	16000	9947.833	N/A
14	3/8/2018	72.8	7074	5870	3165	16109	9841.714	N/A
15	3/9/2018	77.8	7318	5260	4022	16600	10347.62	N/A
16	3/10/2018	75.9	7098	5538	3769	16405	9785.024	N/A
17	3/10/2018	74.5	6890	5445	3140	15475	10136.4	N/A
18	3/11/2018	78	6991	5521	3667	16179	9914.381	N/A
19	3/11/2018	76.4	6953	4886	3605	15444	9944.167	N/A
20	3/12/2018	77.6	6922	5329	3656	15907	9838.024	N/A
21	3/12/2018	73.9	6578	5697	3388	15663	10036.14	N/A
22	3/13/2018	76.9	6937	5745	3788	16470	10094.74	N/A
23	3/14/2018	75.6	6777	5645	3382	15804	9626.667	N/A
24	3/14/2018	76.8	7019	5569	3789	16377	9904.071	N/A
25	3/15/2018	73.3	6736	5665	3264	15665	9994.524	N/A
26	3/15/2018	75.8	6753	5323	3620	15696	9821.905	N/A
27	3/15/2018	77.1	6931	6092	3739	16762	10076.26	N/A
28	3/16/2018	81	6720	5272	3539	15531	9823.5	N/A
29	3/17/2018	73.6	6499	5752	4068	16319	9887.381	N/A
30	3/17/2018	79.1	6713	5476	3738	15927	9814.238	N/A
31	3/18/2018	77.4	6583	5382	3795	15760	9717.643	N/A
32	3/18/2018	74.3	6365	5536	3853	15754	9605.286	N/A
33	3/19/2018	78.4	6710	5763	3758	16231	9710.238	N/A
34	3/20/2018	77.4	6495	5878	3853	16226	9952.738	N/A
35	3/21/2018	76.4	6558	7991	3784	18333	9987.952	N/A
36	3/21/2018	77.3	6569	5585	3724	15878	9946.69	N/A
37	3/22/2018	77.4	6512	6493	3765	16770	9923.69	N/A
38	3/23/2018	76.8	6562	5644	3560	15766	9930.571	N/A
39	3/23/2018	78.5	6466	6335	3880	16681	9838.048	N/A
40	3/24/2018	76.1	6382	6073	3843	16298	9997.262	N/A
41	3/24/2018	78.1	6462	6462	3840	16764	9855.548	N/A
42	3/25/2018	77.2	6749	5973	3580	16302	10053.17	N/A
43	3/25/2018	78.4	6243	4321	3809	14373	9968.476	N/A
44	3/25/2018	76.5	6230	5986	4000	16216	10019.29	N/A
45	3/26/2018	77.4	6122	6493	4259	16874	9926.571	N/A
		76.0	6,902	5,657	3,720	732,588	449,782	TOTAL

API 47-095-02400 Farm Name Vera O. Thomas Well Number Ant Unit 1H				
EXHIBIT 3				
LITHOLOGY/ FORMATION	TOP DEPTH (TVD) From Surface	BOTTOM DEPTH (TVD) From Surface	TOP DEPTH (MD) From Surface	BOTTOM DEPTH (MD) From Surface
Sandstone	85	105	85	105
Sandy Siltstone	105	725	105	725
Sandy Shale	725	865	725	865
Calcareous Shale	865	905	865	905
Shaly Sandstone	905	1,005	905	1,005
Shaly Siltstone	1,005	1,165	1,005	1,165
Silty Shale	1,165	1,345	1,165	1,345
Sandstone	1,345	1,385	1,345	1,385
Sandy Shale	1,385	1,625	1,385	1,625
Shaly Sandstone	1,625	1,685	1,625	1,685
Silty Shale	1,685	1,765	1,685	1,765
Sandy Shale	1,765	1,905	1,765	1,905
Sandy Shale/Coal	1,905	1,991	1,905	2,100
Big Lime	2,006	2,204	2,115	2,273
Big Injun	2,204	2,686	2,273	2,742
Gantz Sand	2,686	2,827	2,742	2,883
Fifty Foot Sandstone	2,827	2,948	2,883	2,991
Gordon	2,948	3,112	2,991	3,181
Fifth Sandstone	3,112	3,393	3,181	3,450
Bayard	3,393	3,697	3,450	3,780
Warren	3,697	4,075	3,780	4,183
Speechley	4,075	4,717	4,183	4,884
Balltown	4,325	4,996	4,683	5,121
Bradford	4,717	4,996	4,884	5,121
Benson	4,996	5,402	5,121	5,502
Alexander	5,402	5,932	5,502	6,094
Rhinestreet	5,908	6,258	6,070	6,401
Sycamore	6,258	6,400	6,401	6,601
Middlesex	6,400	6,492	6,601	6,761
Burkett	6,492	6,518	6,761	6,826
Tully	6,518	6,547	6,826	6,911
Marcellus	6,547	NA	6,911	NA

*Please note Antero determines formation tops based on mud logs that are only run on one well on a multi-well pad. The measured depth (MD) data on subsequent wells may be slightly different due to the well's unique departure.

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	3/1/2018
Job End Date:	4/3/2018
State:	West Virginia
County:	Tyler
API Number:	47-095-02400-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Ant 1H
Latitude:	39.42537222
Longitude:	-80.90408889
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,587
Total Base Water Volume (gal):	19,332,206
Total Base Non Water Volume:	0



Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Fresh Water	Operator	Base Fluid					
			Water	7732-18-5	100.00000	87.55208	Density = 8.330
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	100.00000	0.18829	

SAND-PREMIUM WHITE-30/50	Halliburton	Proppant				Listed Below				
Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.										
			Crystalline silica, quartz			14808-60-7	100.00000	12.21064		
			Hydrochloric acid			7647-01-0	15.00000	0.02082		
			Guar gum			9000-30-0	100.00000	0.01888		
			Acrylamide acrylate copolymer			Proprietary	30.00000	0.01698		Denise Tuck, Halliburton, 3000 N. Sam Houston Pkwy E., Houston, TX 77032, 281-871-6226
			Hydrotreated light petroleum distillate			64742-47-8	30.00000	0.01698		
			Inorganic salt			Proprietary	30.00000	0.01698		
			Ethylene Glycol			107-21-1	60.00000	0.00837		
			Glutaraldehyde			111-30-8	30.00000	0.00259		
			Neutralized Polyacrylic Emulsion			Proprietary	10.00000	0.00140		
			Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl chlorides			68424-85-1	5.00000	0.00043		
			Sodium persulfate			7775-27-1	100.00000	0.00032		
			Ethanol			64-17-5	1.00000	0.00009		
			Methanol			67-56-1	60.00000	0.00007		
			Reaction product of acetophenone, formaldehyde, thiourea and oleic acid in dimethyl formamide			68527-49-1	30.00000	0.00003		
			Ethoxylated alcohols			Proprietary	30.00000	0.00003		
			Fatty acids, tall oil			Proprietary	30.00000	0.00003		
			Olefins			Proprietary	5.00000	0.00001		

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Discharge Monitoring Report
Oil and Gas General Permit

Company Name: Antero Resources Corporation
API No: 47-095-02400 County: Tyler
District: Centerville Well No: Ant Unit 1H
Farm Name: Vera O. Thomas
Discharge Date/s From:(MMDDYY) 07/20/18 To: (MMDDYY) 08/19/18
Discharge Times. From: 0:00 To: 24:00
Total Volume to be Disposed from this facility (gallons): 620,002
Disposal Option(s) Utilized (write volumes in gallons):

- (1) Land Application: _____ (Include a topographical map of the Area.)
- (2) UIC: 255,159 Permit No. 3400923821, 3416729543, 3416729464, 3416729445, 4708509721, 3410523619, 3416729731, 3400923761, 3405320968, 3410523268
- (3) Offsite Disposal: 225 Site Location: Mud Masters
- (4) Reuse: 364,618 Alternate Permit Number: _____
- (5) Centralized Facility: _____ Permit No. _____
- (6) Other method: _____ (Include an explanation)

Follow Instructions below to determine your treatment category:

Optional Pretreatment test: n/a Cl- mg/l n/a DO mg/l

1. Do you have permission to use expedited treatment from the Director or his representative? (Y/N) n/a If yes, who? _____ and place a four (4) on line 7. If not go to line 2
2. Was Frac Fluid or flowback put into the pit? (Y/N) n/a If yes, go to line 5. If not, go to line 3.
3. Do you have a chloride value pretreatment (see above)? (Y/N) n/a If yes, go to line 4 If not, go to line 5.
4. Is the Chloride level less than 5000 mg/l? (Y/N) n/a If yes, then enter a one (1) on line 7.
5. Do you have a pretreatment value for DO? (See above) (Y/N) n/a If yes, go to line 6 If not, enter a three (3) in line 7.
6. Is the DO level greater than 2.5 mg/l?(Y/N) n/a If yes, enter a two (2) on line 7. If not, enter a three (3) on line 7.
7. n/a is the category of your pit. Use the Appropriate section.
8. Comments on Pit condition: n/a No pit on site.

Name of Principal Exec. Officer: Gretchen Kohler
Title of Officer: Senior Environmental and Regulatory Manager
Date Completed: 9/17/18

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and all the attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.



Signature of a Principal Exec. Officer or Authorized agent.

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Category 1
Sampling Results
API No : _____

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	5	_____	N/A	N/A	Days
Fe	6	_____	6	_____	mg/l
D.O.	2.5	_____	2.5	_____	mg/l
Settleable Sol.	0.5	_____	0.5	_____	mg/l
Cl	5,000	_____	5,000	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**		_____	Monitor	_____	mg/l
Oil and Grease		_____	Monitor	_____	mg/l
Total Al***		_____	Monitor	_____	mg/l
TSS		_____	Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume		_____	Monitor	_____	Gal
Flow		_____	Monitor	_____	Gal/min
Disposal Area		_____	Monitor	_____	Acres

*** Al is only reported if the pH is above 9.0

Category 2
Sampling Results
API No : _____

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	10	_____	N/A	N/A	Days
Fe	6	_____	6	_____	mg/l
D.O.	2.5	_____	2.5	_____	mg/l
Settleable Sol.	0.5	_____	0.5	_____	mg/l
Cl*	12,500	_____	12,500	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**		_____	Monitor	_____	mg/l
Oil and Grease		_____	Monitor	_____	mg/l
Total Al***		_____	Monitor	_____	mg/l
TSS		_____	Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume		_____	Monitor	_____	Gal
Flow		_____	Monitor	_____	Gal/min
Disposal Area		_____	Monitor	_____	Acres

* Can be 25,000 with inspector's approval,

(Inspector's signature): _____

Date: _____

** Include a description of your aeration technique.

Aeration Code: _____

*** Al is only reported if the pH is above 9.0

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Category 3
Sampling Results

API No : _____

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	20	_____	N/A	N/A	Days
Fe	6	_____	6	_____	mg/l
D.O.	2.5	_____	2.5	_____	mg/l
Settleable Sol.	0.5	_____	0.5	_____	mg/l
Cl*	12,500	_____	12,500	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**		_____	Monitor	_____	mg/l
Oil and Grease		_____	Monitor	_____	mg/l
Total Al***		_____	Monitor	_____	mg/l
TSS		_____	Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume		_____	Monitor	_____	Gal
Flow		_____	Monitor	_____	Gal/min
Disposal Area		_____	Monitor	_____	Acres

* Can be 25,000 with inspector's approval,

(Inspector's signature): _____

Date: _____

** Include a description of your aeration technique.

Aeration Code: _____

*** Al is only reported if the pH is above 9.0.

Category 4
Sampling Results

API No: _____

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	1	_____	N/A	N/A	Days
Fe	Monitor	_____	Monitor	_____	mg/l
D.O.	Monitor	_____	Monitor	_____	mg/l
Settleable Sol.	Monitor	_____	Monitor	_____	mg/l
Cl*	12,500	_____	12,500	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**		_____	Monitor	_____	mg/l
Oil and Grease		_____	Monitor	_____	mg/l
TSS		_____	Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume		_____	Monitor	_____	Gal
Flow		_____	Monitor	_____	Gal/min
Activated Carbon (0.175)		_____	N/A	N/A	lb/Bl
Date Site Reclaimed	N/A	N/A			10 days from dis.
Disposal Area		_____	Monitor	_____	Acres

* Can be 25,000 with inspector's approval,

(Inspector's signature): _____

Date: _____

LATITUDE 39°27'30"

8,217'

LATITUDE 39°25'00"

6,556' TO BOTTOM HOLE

LONGITUDE 80°52'30"

5,489' TO BOTTOM HOLE

12,006'

LONGITUDE 80°52'30"



Antero Resources Corporation Well No. Ant Unit 1H

AS DRILLED DATA:
WELL 1H TOP HOLE INFORMATION:
 N: 340,139ft E: 1,603,376ft
 LAT: 39°25'31.34" LON: 80°54'14.72"
BOTTOM HOLE INFORMATION:
 N: 331,455ft E: 1,604,904ft
 LAT: 39°24'05.76" LON: 80°53'53.52"
 WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE
 THIS ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOXT SUBMETER MAPPING GRADE GPS UNIT. PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.

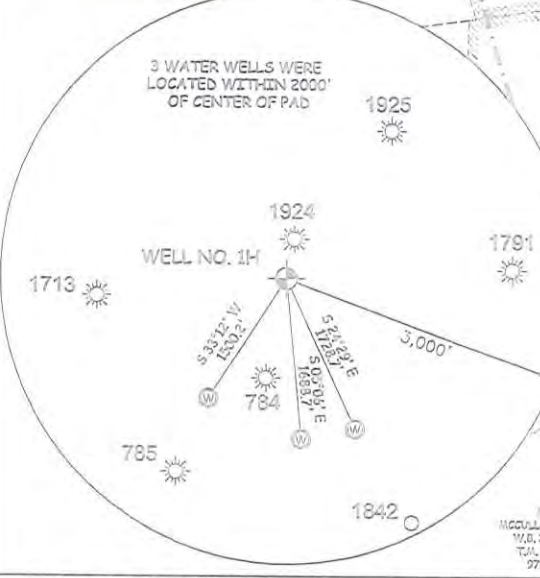
(NAD) 83 (UTM) ZONE 17 COORDS:
WELL 1H TOP HOLE INFORMATION:
 N: 4,363,995m E: 508,270m
BOTTOM HOLE INFORMATION:
 N: 4,361,358m E: 508,780m

04/05/2019

- NOTE**
1. NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.
 2. TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY ALLEGHENY SURVEYS, INC.
 3. AS DRILLED DATA WAS PROVIDED BY ANTERO RESOURCES CORPORATION.
 4. WLS IS NOT CERTIFYING THE DATA AND INFORMATION PROVIDED LISTED IN NOTES 2 AND 3, ONLY THE RELATIONSHIP TO THE DATA AND INFORMATION PROVIDED TO THE LEASE BOUNDARIES.
 5. WLS IS BY NO MEANS RESPONSIBLE FOR ANY ERRORS OR INACCURACIES WITH THE DATA AND INFORMATION THAT HAS BEEN PROVIDED.

PAD LAYOUT
 NOT TO SCALE

MYSTIS UNIT 1H
 MYSTIS UNIT 2H
 MYSTIS UNIT 3H
 ANT UNIT 1H
 ANT UNIT 2H
 ANT UNIT 3H
 ANT UNIT 4H
 SAN JUAN UNIT 1H
 SAN JUAN UNIT 2H
 SAN JUAN UNIT 3H
 SAN JUAN UNIT 4H
 EMERGER UNIT 1H
 EMERGER UNIT 2H
 EMERGER UNIT 3H
 EMERGER UNIT 4H



I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE RULES ISSUED AND PERSCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
 WILLOW LAND SURVEYING PLLC
 220 MASONIC AVE. PENNSBORO WEST VIRGINIA 26415

JOB # 16-045WA
 DRAWING # ANT1HAD
 SCALE 1" = 1000'
 MINIMUM DEGREE OF ACCURACY SUBMETER
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS
 STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS

LEGEND
 - - - - - Surface Owner Boundary Lines +/-
 - - - - - Interior Surface Tracts +/-
 O - - - - - Proposed Well Path
 O - - - - - As Drilled Well Path

Thomas Summers
 THOMAS SUMMERS P.S. 2109
 DATE 10/12/18
 OPERATOR'S WELL# ANT UNIT 1H

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL 47 - 095 - 02400
 (IF "GAS") PRODUCTION STORAGE DEEP SHALLOW STATE COUNTY PERMIT
 LOCATION: ELEVATION 1,148.1' - AS BUILT WATERSHED OUTLET MIDDLE ISLAND CREEK
 QUADRANGLE MIDDLEBOURNE 7.5 DISTRICT CENTERVILLE COUNTY TYLER
 SURFACE OWNER VERA O. THOMAS ACREAGE 51.11 ACRES +/-
 OIL & GAS ROYALTY OWNER NORMAN H. THOMAS ET UX; KATHLEEN L. LOUGH; OPAL G. BERRY; LEASE ACREAGE 125 AC.±; 40.27 AC.±; 32 AC.±; GORDON R. HAMILTON; FRANK S. GRASS; GARY L. HALL ET UX; GARY L. HALL; E. G. BEAM 125 AC.±; 38.06 AC.±; 12 AC.±; 80 AC.±; 317 AC.±
 PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
 PLUG OFF OLD FORMATION PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) AS DRILLED PLUG & ABANDON CLEAN OUT & REPLUG
 TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,571' TVD 15,869' MD
 WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM
 ADDRESS 1615 WYNKOOP ST. ADDRESS 5400 D BIG TYLER ROAD
 DENVER, CO 80202 CHARLESTON, WV 25313